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## PHYSIOLOGY.

**Temperature in Nerves.**—Rolleston,[1] by using an electrical resistance thermometer sufficiently delicate to appreciate one five-thousandth of a degree, finds, like other investigators, no evidence of the evolution of any heat from the nerve during the passage of a nervous impulse. In dying a nerve evolves heat, in some cases one-seventh of a degree C. The frog's sciatic was chiefly used.

**Neurokeratin.**—This substance, characterized by extreme insolubility, was discovered by Ewald and Kühne, in 1877, in medullated nerves and the central nerve substance. Kühne and Chittenden[2] have subjected it to a careful study. The nerve tissue was freed from the myelines by prolonged treatment with alcohol and ether; from all digestible matters by gastric and pancreatic juices; and from nuclein by extraction with alkali. Analyses of neurokeratin thus obtained from human brains gave C 56.11 to 58.45, H 7.26 to 8.02, N 11.46 to 14.32, S 1.63 to 2.24. Noticeable are the absence of P and the low amount of S. C is somewhat higher and N somewhat lower than in albuminous bodies. Ordinary keratin from rabbit's hair gave C 49.45, H 6.52, N 16.81, S 4.02, in which S is double its quantity in neurokeratin. The nerve cord of the lobster, treated in a similar manner, yielded a residue of chitin with no neurokeratin. Quantitative determinations in man gave for peripheral nerves .316 per cent., for cortex of cerebellum .312 per cent., for cortex of cerebrum .327 per cent., and for white substance of the corpus callosum 2.902 per cent. The results indicate for myeline-free, dry nerve substance, 1.91 per cent. of neurokeratin; do. gray substance, 3.22 per cent.; do. white substance, 33.77 per cent. Methods are given by the authors whereby this substance may be detected in nerve fibres.

**Sensitiveness of Joints.**—In studying the muscle sense Goldscheider hypothecates for the joints the two functions of mediating sensations of movement and sensations of resistance. For the former the sensitive substratum is to be found doubtless in the nerves and nerve endings of the capsule of the joint, these being stimulated by the working of the joint. For the latter the question arises whether in the hard surfaces the supposed sensitiveness really exists. He tests this[3]

[1] *Journal of Physiology*, Vol. XI., 1890, p. 208.

[2] *Zeitschrift f. Biologie*, Bd. XXVI.; also *N. Y. Medical Journal*, 1890.

[3] Verhandlungen d. Berl. Physiol. Gesellschaft; in Du Bois Reymond's Archiv, 1890, p. 380.

in the rabbit by touching, pressing upon, stroking, and heating points in the exposed articular surfaces of the tibia and metatarsus, and the deep-lying portions of the bones. Sensations indicated by respiratory reflexes were readily called out. The sensitiveness seems to lie not so much in the surface of the joint as in the layers beneath. No reaction was obtained from the hard bone itself, but the marrow was especially sensitive.

**On the Self-Regulation of Respiration.**—The effect of the stimulation of the central end of the vagus on respiration has been studied long and carefully, and with varying results. Meltzer finds[4] that weak and medium-strong currents have different effects in different individuals; while strong currents produce always the same effects, viz., inhibition of inspiration, followed soon by an inspiratory after-effect. There must then be fibres in the vagus that produce inhibition of inspiration. In some individuals medium and weak stimuli produce inspiratory effects; hence there must also be, in such individuals at least, fibres in the vagus that bring about inspiration. These may be likened to the accelerators of the heart, while the others act like the inhibitors of that organ. We may then conceive of the vagus as consisting of two kinds of fibres, one producing inspiration, the other inhibiting it. When the cardiac inhibitors and accelerators are stimulated together, the effect of the former alone is observed during stimulation; but after the latter has ceased the short after-effect of the inhibitor fibres is followed by the larger after-effect of the accelerator fibres. In like manner, as regards respiration, we may say that the nerve fibres that inhibit inspiration have but a brief after-effect, while those that cause it have a more prolonged influence. It has been shown that expansion by the lungs has the same effect on respiration as a strong stimulation of the vagus, producing first inhibitory and then inspiratory after-effects. Hering and Breuer formulated a now well-known theory of the self-regulation of respiration, the main principles of which are that expansion of the lung produces an inhibition of inspiration, while collapse produces a following inspiration. Meltzer claims that the latter part of this theory is not supported by facts, and substitutes a new theory based on the above conclusions, viz., the existence in the vagus of two kinds of fibres, namely, inspiratory and inspiration-inhibiting. "Inspiration expands the lung, thereby stimulating both the inspiratory and the inspiration-inhibiting nerve fibres. But during stimulation, and for a very short time after cessation of the expansion, the inhibiting

[4] *N. Y. Medical Journal*, Jan., 1890.

effects alone are manifested, thereby inspiration is interrupted, and an expiration, a collapse of the lungs, follows. But since, with the cessation of pulmonary expansion, the given stimulus disappears, and the after-effect of the inhibiting fibres is of but short duration, the latent inspiratory impulses prevail, owing to their long after-effect, and cause an inspiration. This again establishes an expansion of the lung, and thereby an expiration, etc."—L. G.

## ENTOMOLOGY.[1]

**An Outlet for Memoirs, Monographs, and Faunal Lists.[2]**—As a rule the opportunities for publication of the experiment station entomologists are limited to station bulletins, and entomological or general natural history journals. The former, with rare exceptions, are only available for the publication of investigations having an immediate practical import, and the latter can only be satisfactorily used for articles of moderate length. It is true that to a certain extent monographs and revisions can be published in the Transactions of the American Entomological Society and the publications of the National Museum, but these channels are not open to all, and as a rule are reserved for monographic works relating to our fauna as a whole, rather than that of any particular locality.

If the biological work of the experiment stations is established on a broad and comprehensive basis many results will be obtained that are not of immediate interest to the farming community, and which could not be published, except in a fragmentary way, in the existing journals. Among such results the following general classes may be mentioned:

(1) Bibliographical matter, including bibliographies of the insects affecting certain plants, bibliographies of certain groups, faunal bibliographies, etc.

(2) Catalogues, descriptive and annotated, of the organisms of a locality, county, or state.

(3) Memoirs on the biology of certain groups, the insects relating to certain plants, or the relations of various organisms or groups of organisms to each other and to their environment.

[1] Edited by Dr. C. M. Weed, Experiment Station, Columbus, O.

[2] Prepared for Entomological Section, American Association of Agricultural Colleges and Experiment Stations, November, 1890.